ENTRY NO. 7

NAME OF MACHINE Chalk River Superconducting Cyclotron DATE 1978 Aug 15

INSTITUTION Atomic Energy of Canada Limited

ADDRESS CHALK RIVER, Ontario

IN CHARGE J.H. Ormrod REPORTED by J.H. Ormrod

HISTORY AND STATUS

DESIGN, date 1973 MODEL tests 1974-78

ENG. DESIGN, date 1974-77

CONSTRUCTION, date 1978 (Magnet & RF structure)

FIRST BEAM date (or goal) 1981

MAJOR ALTERATIONS

OPERATION, ____ hr/wk; On Target ____ hr/wk

TIME DIST., in house ____ %, outside ____ %

USERS' SCHEDULING CYCLE ____ weeks

COST, ACCELERATOR $2.4 M

COST, FACILITY, total

FUNDED BY

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS and ENGINEERS 7

TECHNICIANS 5 CRAFTS

GRAD STUDENTS involved during year

OPERATED BY ____ Res staff or ____ Operators

BUDGET, op & dev

FUNDED BY

RESEARCH STAFF, not included above

USERS, in house ____ outside ____

GRAD STUDENTS involved during year

RES. BUDGET, in house

FUNDED BY

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed ____ m^2

movable ____ m^2

TARGET STATIONS ____ in ____ rooms

STATIONS served at same time, max

MAG SPECTROGRAPH, type

COMPUTER, model

OTHER FACILITIES

REFERENCES/NOTES

J.H. Ormrod et al (these Proceedings)

MAGNET

POLE FACE diameter 138.6 cm; R extraction 65 cm

GAP, min 4 cm; Field 60 kG
max 64 cm; Field 43 kG
AVERAGE FIELD at R ext 50 kG
} at 5 X 10^6 ampere turns

CURRENT STABILITY 10 parts/10^6; $B_{max}/\langle B \rangle$ 1.2-1.7

NUMBER OF SECTORS 4 ; SPIRAL, max 50 deg

POLE FACE COIL PAIRS: AVF ____ /sec;

Harmonic correction

Rad grad ____ /sec or Circ coils

WEIGHT: Fe 170 tons; Coils 10 tons

CONDUCTOR, Material and type Nb Ti

STORED ENERGY ~25 MJ

COOLING SYSTEM Liquid helium

POWER: Main coils ____ max, kW

Trimming coils ____ max, kW

YOKE/POLE AREA ____ %

SECTOR ANGLE (Sep Sec) ____ deg

ION ENERGY (Bending limit) E/A = 520 q^2/A^2 MeV

(Focusing limit) E/A = 100 q/A MeV

ACCELERATION SYSTEM

DEES, number 4 angle ~40 deg

BEAM APERTURE 3.2 cm; DC BIAS ____ kV

TUNED by, coarse ____ fine ____

RF 31 to 62 mHz, stable ± 1 /10^6

Orb F 5.9 to 23.4 mHz; GAIN, max 800 Q kV/turn

HARMONICS, RF/Orb F, used 2, 4, 6

DEE-Gnd, max 100 kV, min gap 3 cm

STABILITY, (pk-pk noise)/(pk RF volt) 1:10^4

RF PHASE stable to ± ____ deg

RF POWER input, max 100 kW

RF PROTECT circuit, speed ____ μsec

Type

FREQUENCY MODULATION, rate ____ /sec

MODULATOR, type

BEAM PULSE, width

VACUUM SYSTEM

PUMPS, No., Type, Size 2 cryo panels

OPERATING PRESSURE 0.5 μTorr,

PUMPDOWN TIME ____ hrs

ION SOURCES/INJECTION SYSTEM

13 mV Tandem Van de Graaff

EXTRACTION SYSTEM

Orbit perturbation, electrostatic

CONTROL SYSTEM deflector, magnetic channel

ENTRY NO. 7 (cont.)

CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	C^{12}	600	
	U^{238}	2380	
CURRENT		(μA)	(μA)
Internal			
External	C^{12}	.200	
	U^{238}	.004	
		(part/s)	(part/s)
Secondary			

BEAM PROPERTIES

	Measured	Conditions	
Pulse Width	____ RF deg	____ μA of ____ MeV	____
Phase Exc, max	____ RF deg	____ μA of ____ MeV	____
Extract Eff	____ %	____ μA of ____ MeV	____
Res, ΔE/E	____ %	____ μA of ____ MeV	____
Emittance			
(mm-mrad) { ____ axial / ____ radial }		____ μA of ____ MeV	____

OPERATING PROGRAMS, time dist

Basic Nuclear Physics ____ %
Solid State Physics ____ %
Bio-Medical Applications ____ %
Isotope Production ____ %
Development ____ %
____ %
____ %

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, OPERATION SUMMARY, ADDITIONAL REFERENCES